

Eliminating Secondaries — A Primary Goal

Streamlining processes and cutting out the need for extra operations has fueled D&S Machine Products' growth.

By John Iwanski

Photos by Charles Celander

It's a short walk from the front offices of D&S Machine Products, Inc. to the secondary operations department in the back of the company's Aurora, IN-based facility. You pace down between the rows of Acme multi-spindles, the din of spinning brass, aluminum and steel reverberating off the walls. You round the corner to enter the department and are greeted with — shelves? Row after row of spare parts and tools for the company's equipment stand where Bridgeport and Cincinnati mills, an Astro 24-in. broaching machine, and drill presses once stood. It makes you feel as though you're Bugs Bunny, asking yourself if you should have made that left turn at Albuquerque.

"We took 'em all out," proudly says owner Dan Fugate. "Some of them are off the property in the storage barn at my house. Others we've sold off or are in the process of getting rid of. But we had to do it to stay competitive. We've eliminated those operations by combining them in single-operation processes, opened up new space without having to expand and been able to start experimenting in new areas like stamping. It's been a win-win for us all the way through."

A Daunting Challenge

Man has always been obsessed with speed, seeking out ways

to move himself, goods, and information faster and more efficiently. Occasionally, these changes are a result of pure happenstance, but more often than not, progress results from competition and the constant pressure from others to do things better. "You have to come up with more creative ways to manufacture parts today," notes Kris Fugate, sales manager for D&S. You have to figure out how to do a procedure in one step whenever possible — and do it better and less-expensive than anyone else." That pressure is what led D&S to take secondary ops completely out of the picture. The results are a simplified plant structure, higher quality, fewer defects and a growing, satisfied customer base.

It was in-house innovation and adaptability that allowed D&S to take on many of the jobs the company was running on its stable of Acmes and Davenport. But no amount of inventiveness could change the fact that cycle times were becoming uncompetitive on its conventional screw machines. And many of the parts still had to go to the company's secondary ops department. "We had one part that we would put on an Acme, take it off that machine, send it over to the broach, then bring it back to a drill press for another hole. And we still had to finish the piece," states Kris Fugate matter-of-factly. "There is NO WAY you can do that and stay competitive."

Being in the Know

For D&S, the approach to eliminating secondaries was simple: Use the expertise of in-house engineering; incorporate the company's tool-making capabilities, then attack secondary operations one department at a time.

"With the rapid improvement of technology, the recession of the last few years and the push from suppliers, we made the decision to figure out better ways to run," says Dan Fugate. "But we did it in an organized fashion, and it has proved to be one of the best things we could have done. We knew we could make tools here. We had the engineering expertise and the understanding of how to make a marginal job profitable. The foundation was here. Implementing it right was critical."

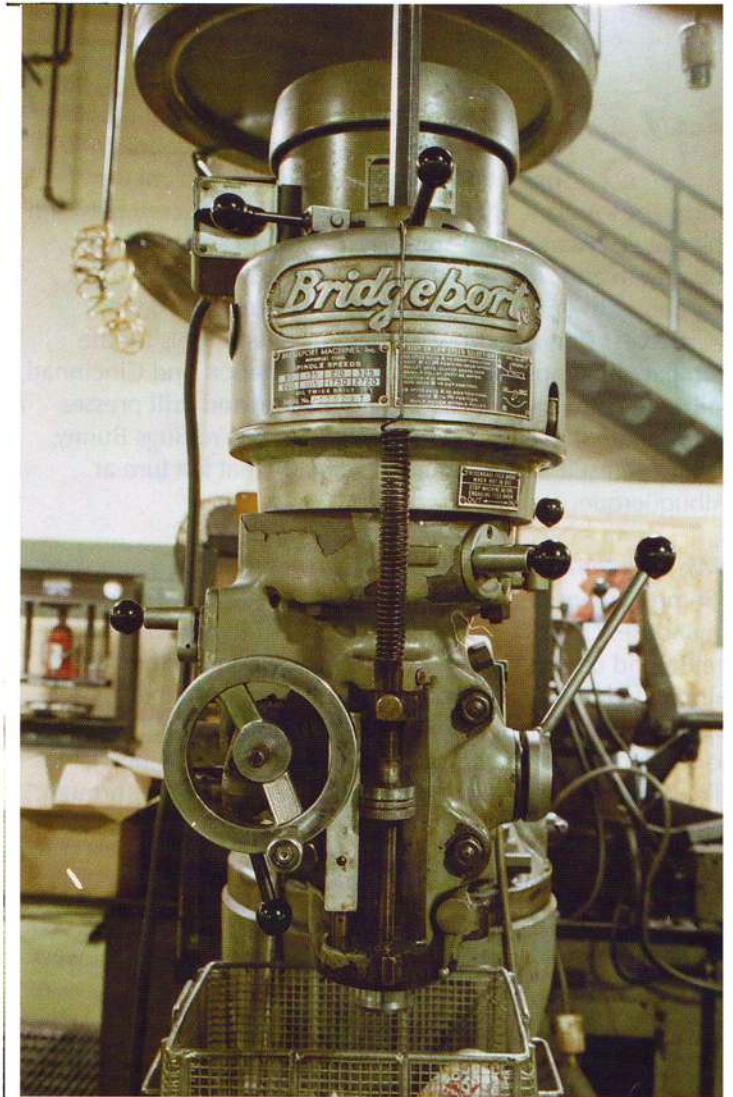
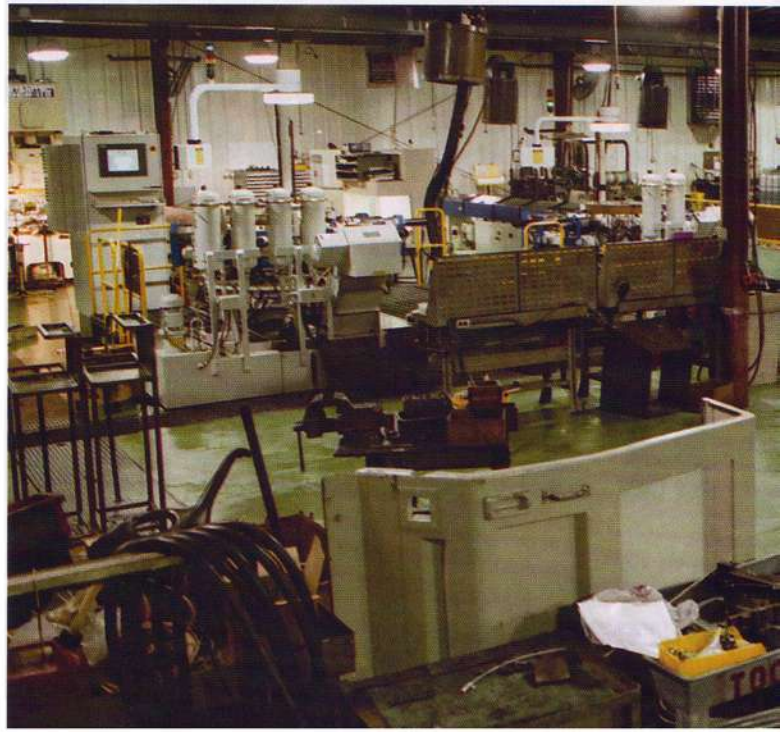
The company looked at each department and followed a straightforward checklist:

- Can we run a part faster on the current machine?
- Can we alter the machine so that the part can be run more quickly?
- Can we combine operations to complete a part?
- Is there a better machine to perform the operation completely and efficiently?

This methodology allowed the company to perform a type of self-analysis that showed exactly where its strengths — and weaknesses — were. Team leaders talked to operators, then met with management to discuss where improvements could be made. Once the company started to revamp its operations, the transformation snowballed. These discussions and realizations led the company toward rotary transfer machines, specifically Hydromats.

Learning Rotary Transfer

D&S began to incorporate rotary transfer equipment into its operations, quoting jobs and learning the differences between running jobs on single and multi-spindle units versus rotary units. "We had to learn to look at it from every angle," says Dan Fugate. "For the jobs we run on rotary transfer, the key is angles, speeds and feeds, and tool clearance. Tooling on a rotary is pretty much the same as what you run on a multi, but holding the dimensions is





A view of the D&S shop floor (above) reveals that the real estate formerly occupied by secondaries now hosts storage and space for more Hydromats. Below (left), a BridgePort drillpress awaits packing and removal, its role now eclipsed by the Hydromats (lower right).

critical to these jobs, and you have different toolholders. Plus the machine is running faster, with parts coming off line much quicker; the process offers more opportunities for a mistake, so you have to have procedures in place to eliminate that.”

The company made the decision to bring a Hydromat in, and didn’t look back. Kris Fugate notes that the quoting process is the same as when a job is priced for work on conventional screw machines. He gets a print and reviews it; sends it to Hydromat and gets a budgetary proposal; then builds a quote and discusses it with Dan Fugate and others in engineering, particularly lead engineer Brian Knigga. Then the fun really begins.

“We had one piece that was running on a multi-spindle,” notes Kris Fugate. “We’d run it on the multi with just one hole in it. Then we’d use an offset drilling machine to drill the offset hole in it. The part has to be burr-free, so then we’d take the drill press down to deburr it, and then we still had to tumble it to get rid of the burrs. We did it that way because we didn’t have the technology to run it complete in one step, and we didn’t need to. Competitive pressures changed all of that.”

The addition of the 12-station rotary machine totally altered the manufacturing process. “Now we have offset drills that come in to drill the part,” adds Kris Fugate. “Then the machine inverts the part and we have a CNC slide with a special tool that profiles and deburrs the whole part.” The purchase of the Hydromat meant moving the job off four different machines. As for cycle time? “I couldn’t even tell you what the total machining time was the old way. But now we run it complete in six seconds,” he says grinning, “and we still have the job running.”

This doesn’t mean that D&S doesn’t run parts on its multi-spindle machines. Some jobs remain on those units because it makes the most economic sense to keep them there.

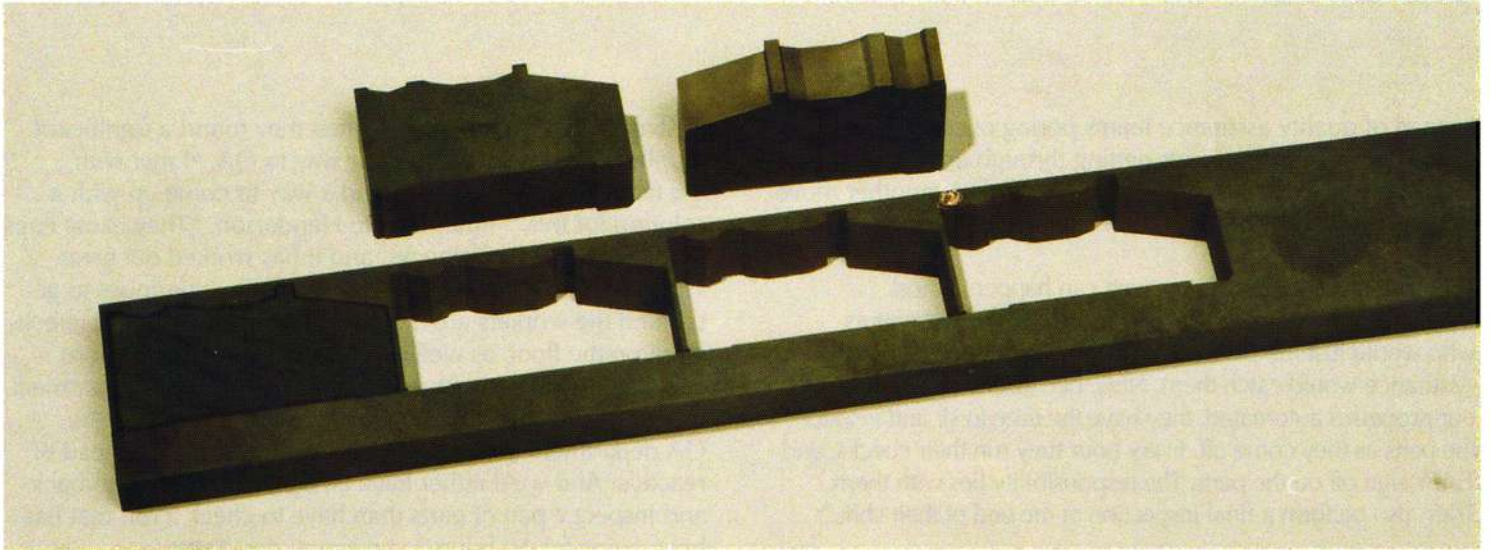
“In the case of the part we were just discussing, originally we quoted it on the Hydromat,” says Kris Fugate. “We knew we had to do it that way. But we ran it the multi-step way during PPAP and testing while Hydromat was tooling it up and custom designing the machine specific to the job. But when we make the transition over, it is a night-and-day difference with how much we can move over to shipping, plus it frees up operators to work on other projects.”





The purchase of a Hatachi Wire EDM (above) has given D&S an edge in manufacturing its own custom tooling. Grinding existing tooling now runs automatically on a Blanchard table grinder (below).





Cutting multiple tools in one setup is another benefit of the Wire EDM operation.

On the Grind

The toolmaking capabilities at D&S play a major factor in how jobs are quoted and, ultimately, how profitable a particular part is going to be. So it made perfect sense five years ago for the company to start exploring ways to speed up operations in the tool room. Short lead time, just-in-time delivery and long lead times from outside toolmakers led D&S to the purchase of wire EDM. The company looked at what options were out there and purchased a Hitachi wire EDM unit. The programming for the machine was all done in-house, giving D&S flexibility to make changes quickly to its own specifications. "It's a simple program to use," notes Steve Erfman, a toolroom operator who has been with the company for a little more than a year, coming to D&S from another shop where he worked as an EDM operator. "And because it's set to our own parameters, we can make programming changes to fit our production schedule. We're not restricted by what the software can do."

Another benefit of that EDM flexibility lets Burton and Erfman set up production runs on the unit to cut multiple tools in one operation. "We'll lock the piece of carbide, take the dimensions off the print and enter it into the computer, and then let it go. Depending on the size of the tool that we need, we can cut three, four, as many as eight tools in one setup," says Burton.

The EDM purchase made toolcutting simpler, but was just one step toward efficiency. They bought a Blanchard 8AD-12 table grinder to work in tandem with the EDM unit to truly alter the modus operandi of the toolmaking department. "That time that would be spent regrinding a tool down to a particular tenth, that's all gone," says Erfman. "You come in and there are tools set out that need to be reground. We put the tooling on the grinding table and set it, and it goes. Chad or I can go back into the toolroom, check on new tools that we have running on the EDM, inspect the tooling that we have coming off, or plan out how we can set up our next run on the wire unit the most efficiently."

Inspecting Technology

"The fact of the matter is that the advances in machinery over the last decade have really been amazing," says vice-president Kelly Fugate-Henderson. "There just are so many more options available now, and that has really been a driver in improving efficiency. Those improvements free up employees to do other things, and that is an area we are really focusing on now — having employees inspect and check their own work."

The addition of equipment such as Fadal milling machines, Wickman multis and Hydromats means that once a machine is tooled up, it is running significant numbers of product.

Instead of quality assurance teams poring over work from operators, or defective parts getting through and requiring the inspection of an entire run of parts, D&S made another move to eliminate steps, this time in the inspection process.

"Eliminating secondary operations can happen almost everywhere," notes Fugate-Henderson. "We had operators who would just run parts, drop them in, then see if Quality Assurance would catch them. Now, because we have many of our processes automated, they have the time to sit and inspect the parts as they come off. Every hour they run their checks, and THEY sign off on the parts. The responsibility lies with them. They also perform a final inspection at the end of their shift."

D&S came up with this plan when they found a significant number of defects making their way to QA. "I met with the team leaders and said, 'Find a way to come up with a solution for this,'" notes Fugate-Henderson. "They came back with this plan of self-checks, and it has worked out great. They are finding more defects now, quality continues to go up, and the workers are more involved." QA still spot checks work on the floor, as well as conducting first-inspections and other critical measurements, but it gives that department the time to handle critical quality issues. "It frees up the QA department and allows them to be proactive instead of reactive. And we'd rather have an operator have to go back and inspect a pan of parts than have to check a run that has been going for 10 hours," she concludes. **TMW**



Some jobs are set up on the multi-spindle machines because it makes the most sense – others only until a rotary solution is in place.